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ABSTRACT

This case study reports on the language development of a child with severe speech and multiple handicaps resulting from "severe epileptic encephalopathy" who is, however, able to competently read, write, and comprehend two languages (English and Cantonese) but does not initiate conversations. Data were gathered as a result of weekly home visits over 8 years (beginning when the child was 2.5 years old). The case is interpreted in the context of speech act theory. Analysis of the child's receptive language skills are reported for: responses to "Wh" questions; classification; sentence completions; word knowledge; and reading comprehension. Her expressive skills (using writing or Morse Code) are analyzed for: mean length of utterance; variety of parts of speech used; variety of sentence types used; complexity of sentence patterns; and language interactions and conversation. Results suggest that a high level of language comprehension and ability to read and write does not automatically transfer to conversational competence or narrative ability. Conclusions also suggest the importance of interactive language experiences for children who depend on augmented and assistive systems. Includes 18 references. (DB)

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Language and Communication in the Absence of Speech:

A Case Study

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Language and Communication in the Absence of Speech: A Case Study

ABSTRACT

Many children who cannot speak comprehend both oral and written language. They become readers and communicate their understanding with the aid of augmented and assisted systems. Augmented system users experience specific difficulties in initiating and maintaining conversations and making use of the pragmatic functions of language.

The purpose of this study was to investigate the semantic and syntactic knowledge of a child with severe multiple disabilities who can read and write and comprehend two languages, but does not initiate conversation. The disparity between receptive and experessive aspects of language development is addressed. The data for the study was gathered over eight years. Speech Act theory was used as a conceptual model for understanding the communication problems of children with severe speech and physical handicaps.

The results of this study suggest that a high level of language comprehension and ability to read and write does not automatically transfer to conversational competence or narrative ability. Discourse and narrative ability are acquired together with pragmatic functions in the course of social interactions with responsive communication partners. The study highlights the importance of interactive language experiences for children who depend on augmented and assistive systems.

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Language and Communication in the Absence of Speech: A Case Study

Most of the language that children experience is embedded in the pursuit of their goals; they demand objects or actions, they control and influence events; they ask questions about the world; they extend reality through imagination and tell others about their ideas. (Hall, 1984). Oral language is deeply embedded within the full range of children's social and environmental interactions. As children learn to speak, they experience language as a powerful tool of social negotiation. Helping children who use augmented systems of communication to discover the power of communication is of concern to parents, teachers and therapists working with children with severe spech and physical disabilities.

. Many children who rely on augmented systems have problems intiating and sustaining conversational interactions, despite their abilities to comprehend, read and write, (Calculator, 1988; Bucholz and Wiemann, 1989). Communication breakdowns with even familiar partners are frequent (Calculator, 1988). Children who cannot speak experience their language in ways that are different from childen who can speak. Studies of the language development of children who use augmented systems can help to clarify the source of their problems and indicate ways of facilitating conversational interactions.

The study reported here is an account of the language development of a child with severe speech and multiple handicaps. Mimi (a fictitious name) is able to read and write and comprehend two languages (English and Cantonese). Her level of language compehension far surpasses her ability to produce language. The author became acquainted

with Mimi when she was 2 1/2 years old. The record of Mimi's language development consists of diaries and videotapes. The author met with Mimi at her home weekly for the past eight years. The case study has been important to the field of child language research (Baghban,1984). Research on child language has developed theory using the case study as its primary method (Brown, 1973; Bloom;1973; Halliday 1973). The study will describe the subject's early development and language experiences; analyze her receptive and expressive language and suggest some ways of encouraging language production.

A conceptual model of communication based on speech acts has proven useful for understanding how children learn to participate in conversation, engage in disalogue and tell stories (Baghban, 1984).

Discourse is more than the ability to converse; it is also the ability to tell stories and organize experience into words (Brown, 1975). Discourse abilities are based on a variety of language interactions with both oral and written language (Baghban, 1984). Speech acts are conversation in context. Reading is a process of constructing meaning from text and includes comprehension as well as decoding of symbols (Chall, 1973; Koppenhaver & Yoder, 1991). . Chall (1973) noted that reading has more in common with listening than with speaking.

Speech Act Theory

Speaking is engaging in speech acts, and listening is attempting to understand the intentions of speakers (Menyuk,1981). When children learn to speak, they learn not only how to convey a thought in words, but to

accomplish some purpose (Menyuk, 1981) . Intention as well as application of semantic rules permit the rendering of a speech act, that is, to attest to a state of affairs, to lie, tease, question or demand. (Menyuk, 1981). The intention of the speaker and the content of the message determine the form of the utterance (Menyuk, 1981).

Young children become able comunicators long before they use words. Bruner (1975) recognized the importance of the principle of reciprocity to language learning. Through reciprocal relationships with their communication partners, the child comes to understand that meanings can be shared. Grammatical rules are derived from context bound messages in which setting, paralinguistic features, and verbal messages all contribute to meaning (Cook-Gumperz, 1975).

To participate in conversational interactions speakers must know how to secure the attention of listeners, introduce novel topics, make topically relevant propositions, and signal listeners to take their turns (Ochs & Schieffelin, 1983). Interaction with different communication partners teaches the child that different partners have different information needs (deVilliers and deVilliers, 1978). Body language in the form of arm and hand movements, facial expressions and voice tones contribute to the meaning as well as the intention of oral speech (Wood, 1983).

Dialogues can be carried on without words. Intention can be efectively conveyed with facial expression, vocalizations and eye movements. Biographies of gifted writers such as Christy Brown and Christopher Nolan (1988) contain vivid dscriptions of their methods of communicating with their families. Ruth Sienkiewicz-Mercer (1989)

described how she was able to communicate with other physically impaired individuals.

"Whenever something screwy or annoying happened, we sounded off about it, as much to inform each other of what a particular sound was supposed to mean as to comn ent on the event itself. We became attuned to every change of tone and pitch in each other's repertoire of sounds, familiarizing ourselves with what each sound meant in terms of emotion, opinion or thought. To demonstrate the significance of our expressions, we studied each other's face while repeating our sounds over and over." (p. 65).

Non-verbal dialogues contain the elements of reciprocity and the transmission of information that characterize the discourse of speaking children, but they are more dependent on context than verbal discourse. Calculator (1988) attributed the passivity of augmented system users in convereational interactions to lack of responsiveness of communication partners to their non-verbal communication efforts. Buzolich and Wiemann (1988) found that communication partners carry a disproportionate degree of responsibility for "carrying on the conversation". Communication boards are discarded or lost when users are not able to derive as much satisfaction from their use than from more immediate communicative signals such as gestures, eye gaze or vocalizations (Calculator, 1988).

Koppenhaver & Yoder (1991) noted that the problems of augmented system users in learning to read appear to be related to lower rates of social interactions experienced by augmented system users (Koppenhaver & Yoder, 1991). The case study which follows illustrates the importance of experience in language interactions.

The Present Study

Mimi is attractive eleven year old girl with severe multiple handicaps. She is unable to speak. Her problems began at the age of four months with the onset of Infantile Spasms, a severe form of Infantile Epilepsy. Mimi's present condition is described as "severe epileptic encephalopathy" with severe spasticity in all four limbs (Medical Report, 1984). Diagnoses of "West syndrome" and "Lennox-Gestaut Syndrome" were also made (Medical report, 1984). Mimi experienced decreased vision as well as severe myoclonic seizures (Medical Report, 1980). The severity of Mimi's physical disabilities and the fact that she could not speak led to the assumption of severe mental handicap as well. Her hearing was not affected. Mimi has limited use of her right hand and learned to write with a hand over hand technique at the age of six years. She presently attends a public school class for children with multiple disabilities and spends part of every school day in a regular Grade Five classroom. Morse code has been used as an augmented system for the past five years. Mimi works with an Apple IIE computer at school.

Early Communicative Interactions

From an early age, Mimi used her ability to vocalize to gain her parents' attention. Her mother noted that from the time she was two years of age, she consistently used vocal sounds to gain attention or relief and carried on long "conversations" with her father. Her father frequently held Mimi on his lap and talked to her. There was a pronounced difference in the quality of her vocalizing when she was calling for attention and

when she was "singing" or "talking". She vocalized loudly when she was angry or wanting attention, and with softer vowel like sounds when she was happy. Mimi vocalized upon waking in the morning, and when songs were quietly sung into her ear. She enjoyed producing voice and was aware of her own vocal productions. Both intention and participation were communicated by vocalization.

Her parents frequently read to her and spoke to her in both English and Cantonese. Her Cantonese speaking grandparents also lived in the home and frequently looked after her. Stories and rhyme that depended on rhyme and alliteration elicited smiles and happy vocal sounds. Her favorite books included The Owl and the Pussycat , The House that Jack Built, Old MacDonald Had a Farm and A Cat in the Hat. Sounds such as"Grr", "Zoom", "Purr", "Meow" Whoosh", "Swish" never failed to elicit smiles and happy vocal sounds. To this day, Mimi enjoys listening and participating in the telling of poems such as Alligator Pie and the poems of Shel Silverstein.

Nursery rhyme routines were employed to encourage Mimi to initiate interactions. For example "London Bridge"was combined with holding Mimi's hands and moving back and forth, "Peas Porridge" involved hand clapping etc. Mimi indicated her participation by vocalizing. New rhymes did not elicit vocalizations until they became familiar. (It is interesting to note that a significant correlation has been reported between listening to nursery rhymes in the early years and later reading skill (Bradley et al, 1990)).

A variety of hand over hand activities were introduced to enable Mimi to experience actions with objects such as stacking small wooden and foam rubber blocks, rubber squeeze toys that squeaked when pushed,

tearing tissue paper, pounding and squeezing clay and play-doh. Mimi's fingers were positioned around objects to enable her to hold them. In this way she was able to feel their weight, texture and form. Mimi asociated objects with both their names and the actions connected with them. When requests such as "touch", "look", and "reach" were incorporated into rhyming chants, Mimi was able to execute them. Chants were used to encourage motor responses to pictures and toys. For example the following chant was used to encourage looking, touching and reaching.

Big Bear Big Bear, Look At Me

Big Bear, Big Bear, What do You See"

"I see Mimi, looking at me," " touching me" , "reaching for me" etc.

At the age of four years, Mimi responded to these chants with the appropriate actions 75% of the time. Mimi learned to operate a "Yes and No" electronic device and a tape recorder and radio with the use of a switch at five years of age.

Written Language and Reading

Reading and writing was introduced when Mimi was six years of age. A hand over hand procedure was used to show Mimi letter shapes. With support to her wrist and fingers to help her maintain a grasp of the pen, she accurately produced letter shapes and produced them on request with 100% accuracy. She seemed to know what the letters represented and knew that she was printing. No other manual activity came close to producing the level of intense concentration as writing. Confirmation that she was able to write was attained by having her write with different adults. Mimi wrote equally well with several adults. Words were

introduced and printed on cards. Mimi copied words, phrases and sentences and made word selections with eye gaze.

Morse Code was introduced when she was eight years of age. Considering that she onlyn received instruction on the Morse Code once a week, Mimi mastered the code quickly.A buzzer designed for physically impaired people, was used for teaching and working with the Code in her home. Mimi did not have access to a communication device in her home. Although she sometimes requires support to her arm while she is working, she is able to press the buzzer (and other switches) independently. It should be noted that Mimi's physical abilities vary; her control over eye gaze and hand strength are not consistent. Confirmation of her ability was gained by having her work with a number of adults. She is fast and for the most part, accurate. The data reported here are based on both Morse Code and writing.

Mimi communicates with her teacher and peers with eye gaze responses to Yes/No questions. And while she enjoys the attention of her peers, she does not initiate interactions with them. Her peers are encouraged to ask her questions and Mimi responds about 50% of the time. Mimi continues to rely a great deal on her teachers in order to communicate and uses language only when it is requested.

Language Proficiency

Language proficiency includes both receptive and expressive language. Receptive language is discussed under the following five headings:

1. Responses to Wh Questions
2. Classification

3. Sentence Completions

4. Word Knowledge; Definitions, Opposites, Analogies, and Knowledge of Parts of Speech such as Pronouns, Verb Forms, Adjectives, and Spelling and Rhyming

5. Reading Comprehension

The level of Mimi's receptive language was evaluated with a varety of formal and informal tests.

Samples of the sentences Mimi wrote or communicated by means of writing or Morse Code were recorded. For purposes of analysis, sixty sentences that Mimi produced without assistance were analyzed. The analysis included::

1. Mean length of utterance.
2. Variety of parts of speech used.
3. Variety of sentence types employed: Statements, Questions, Exclamations
4. Complexity of sentence patterns.
5. Language Interactions and Conversation

I.. Responses to Wh Questions

In order to reply to a Wh question the child must have concepts of person, objects, time, space, and causality. Wh questions make use of interrogative pronouns for which referents are not obvious. A series of over 200 questions Wh questions were given. Mimi's answers are consistent and accurate in her answers to "What", "Why", "Where", "When" and "How" questions. She often supplied full sentence responses. The following are some sample questions and her replies:" Where do wild cats

live?" ("The wild cats live in Africa, Asia, America") . "How do you know that Toad was rich" ("He lived in a big house." "He bought a big car."). "Why do you think that animals who live in cold places have fur?" ("Polar bears have fur to keep them warm.") .

Auditory memory was tested with a series of stimulus statements,such as "I bought some coffee, bread and milk. What did I buy?" or "We traveled to Spain, France and China. Where did I travel?" Mimi responded to twenty five such stimulus sentences without error.

2. Classification

Classification depends on the ability to categorize by abstracting a single feature. Mimi was able to classify with features such as color, shape, size, and categories, such as "habitat", emotion, families of birds and animals. Mimi correctly classified a series of birds and animals according to habitats in which they lived, such as "rain forest", "jungle", and the "Arctic". She classified by characteristics of size, and family groups, such as "mammals", "reptiles" etc. Mimi is aware of such distinctions as "real" and "pretend". When asked to list "pretend" characters, Mimi replied, "Ninja turtles", "ghosts", "monsters" and "talking puppets".

3. Sentence Completions

Ability to complete a sentence demonstrates word knowledge as well as sentence comprehension. Sentence completions were used to test vocabulary, usage of parts of speech and reading comprehension.

Sentences, such as,"The mailman delivers the ("mail")., "You

shampoo your ("hair")., "You cut paper with ("scissors.") demonstrated Mimi's considerable vocabulary and knowledge of objects.

Mimi often completed a sentence with a direct quote from the book. For example when reading the The Wind in the Willows, Mimi was given the sentence "Rat says....." She completed the sentence with the quote, "The river is all there is.", an exact quote from the book. Mimi completed 200 sentences completions without error.

4. Word Knowledge

Definitions

Mimi was asked to define 40 words, taken at random from a Junior Dictionary. She offered definitions to 75% of the words. Sample definitions consisted of such sentences as "Gentle means to be kind." "Sorrow means to be sad".

Analogies

Mimi scored 100% on a formal test of analogies (ITPA). Analogies included "The hand is to the arm as the .("foot".) is to the leg". In addition to analogies, Mimi is also able to respond to similes, such as " "It is cold as ("ice").

Opposites

The concept of opposites was tested with 50 words. Mimi was giveb a list of 50 written words and asked to supply their opposites. Both simnple and complex words were included. Sample words and answers are "long", ("short") , "noisy" and ("quiet") , "hard "and ("easy"). Mimi's score was 100%.

Parts of speech: Pronouns, Adjectives, Verb Forms and Prepositions

Her knowledge of pronouns was tested by giving Mimi a series of 25 sentences and asking her to transform the nouns into pronouns. She completed the test without error.

Mimi's concepts of adjectives as "describing words"was tested in two ways: 1) she was asked to write the nouns that were described by 50 adjectives, 2) she was asked to write the adjectives that would describe a list of 50 nouns, 3) she was asked to choose which of two adjectives were most descriptive of a storybook character or event. (These tests were given ten words at a time.) Mimi scored 100% .

Knowledge of verb forms were tested by asking her to convert a series of 50 verbs into past tense and participle form. She completed the test without error.

Prepositions wee tested by requesting Mimi to choose the appropriate prepositions from two choices from a series of 40 prepositional phrases, embedded in sentences. Sample sentences included, "The boy was "in", "by" the house. "The book was written 'by' ,'with the author".

Spelling and Rhyming

Spelling and rhyming indicate knowledge of word sound and structure. Spelling was tested by telling Mimi the words and asking her to spell them. She spelled over 200 words with 90% accuracy. The words included words of two and three syllables such as such as conscience, conversation, disappoint,splendid, extraordinary, astronomy, enchant, carnivore, rhododendron, orchid. Her understanding of the phonetic

structure of words was further demonstrated by her ability to write words when given initial or final letter sounds. She can supply medial vowels when presented with initial and final letters. and supplies words for such letter combinations as "ph", "th", "sh" "ch".

Mimi rhymed 50 words with 100% accuracy. Rhymed words include words of two syllables, such as "matter", "rounder", and " "swinging".

5. Reading Comprehension

Reading comprehension was tested by giving her a series of 40 questions based on 20 paragraphs, such as the following:

> Maria had to leave school early. When she reached home she moaned, "My stomach aches and I feel dizzy and cold". Maria went upstairs to go to bed. "Here's a warm blanket", said her mother. "I'll get you something to make you feel better."

Mimi's answers to sentence completions are in parentheses. Maria feels ("dizzy, cold")., Maria's mother feels ("sorry.") for Maria.

Reading comprehension was also tested by asking her questions, sentence completions and choosing the most appropriate response from two choices. Questions and sentence completions dealt with complex relationships between character and event, character motivation, sequence of events, story details, and main themes. Her responses reflected her comprehension of text that she read herself, heard on tape, or was read to her.

Mimi is able to read age appropriate books. Her choice of books in

the school library reflect her interests in people and animals. Both her book and tape choices are age appropriate. She was observed to cry when listening to Anne of Green Gables. When asked why she was crying, she indicated that the story was sad. Mimi's explanations are not elaborate; she rarely goes beyond what is clear
from the text.

Table I shows Mimi's scores on tests of language comprehension

(Place Table I about here)

Expressive Language

Sixty sentences composed by Mimi were analyzed. Most of the sentences were produced after Mimi was asked to "Write a sentence", Tell a thought", or " Tell me what you are thinking about?" These sentences were not replies to specific questions. Mimi was free to express what she chose. Forty sentences began with the pronoun "I" and simply described her feelings. e.g. "I am feeling happy","I like to read", "I am writing." Although all the sentences were complete, they offered little information.

1. Mean Length of Utterance (MLU)

The mean length of utterance of the sixty sentences was 4.9. The MLU reflects the paucity of Mimi's spontaneous language rather than an inability to produce longer sentences. Ten of the sentences consisted of seven or eight words.

Sentence frames were used to encourage Mimi to produce more language. Mimi expressed her own ideas with sentence frames such as "I think about....", "I go.....", "I like..... "I do....." Mimi wrote, "I think about

me." " I want to write on a computer","I go to school", "I go home"., "I go to shops outside"., "I like candy"., "I like to talk with Morse Code.","I do work", "I do eating.", " I do sleeping."

2. Variety of Parts of Speech used in Expressed Utterances

Auxiliary verb forms, adjectives, articles, pronouns, participles and infinitives were represented in the sample of spontaneous sentences, but there was little variety of topic or vocabulary. Mimi comprehends and spells difficult and unusual words, but rarely used them spontaneously.

3. Variety of Sentences Used

The 60 sentences were of the simple declarative variety, although Mimi can formulate question forms. She is able to invert as well as formulate "Wh" questions. Mimi transformed series of 25 declarative sentences into questions. She completed this test without error. Sample sentences were "The dog is very big" (Is the dog very big?) "The book is interesting"? ("Is the book interesting?")

A question - asking game was also introduced to provide opportunities for Mimi to formulate questions. The game involved turn-taking, formulating and answering "What", "When", "Where" and "Why" questions. Mimi had little difficulty composing questions.

4.. Complexity of Sentence Patterns.

All 60 sentences were simple declarative clauses. No coordinate, subordinate or relative clauses were noted, although Mimi can read and comprehend complex sentences.

5. Language Interactions and Conversation

Mimi was encouraged to tell stories by giving her incomplete sentences and requesting her to complete them e.g..

"One day a girl went to ..... She was....." Mimi wrote:

"One day a girl went to the hospital. the hospital. She was sick. There were doctors. She was there for a short time." (This was written a short time after she was in the hospital for minor surgery).

Her first poem was elicited by giving her a first sentence:

" Up, up, up in the sky.
I wanted to be up,
But I can't fly.
I wanted some wings.
And some other things
But I don't know how to sing."

Interestingly, Mimi's first spontaneous comment concerned singing. The sentence occurred when Mimi was asked to write some words that began with "w". She offered the word "wish" and was asked what she wished. She wrote, "I wish I could sing on television." She was then asked what she would sing. She replied "I could sing a Christmas carol".

Mimi has been introduced to riddle questions such as "Why did the chicken cross the road?" or "How did four elephants get into a little car?" She remembers and replies with verbatim answers to riddle questions. The high degree of comprehension of both spoken and written language would seem to preclude language processing difficulties as an explanation for

the paucity of expressed language. Mimi's parents and caregivers attest to her comprehension of Cantonese. She enjoys listening to conversations and rhymes and stories in Cantonese as well as English.

Discussion with Mimi about why people have conversations produced the following comments. "People talk to tell their names", "ask names", and "talk to friends". Her awareness of language as a social tool is beginning to emerge.

Discussion

Mimi reads well and understands English in a variety of accents. One of her favorite tapes is that of a British actor reading Robin Hood. Mimi's experience of language is that of a listener, a receiver of information. She seeks meaning from text and absorbs information from the language of others. Her interest in books allow her to vicariously experience adventures and experiences that are denied to her in real life. She likes fairy tales and other books that exercise her imagination.

Mimi does not spontaneously ask questions, initiate language interactions, voice personal opinions, or use language to meet basic needs. She continues to rely on cheery vocalizations to express enjoyment and grunts or cries to express discomfort. When children approach her at school, she will often acknowledge them with a smile and sometimes by vocalizing. When they ask her questions she will sometimes respond by indicating "Yes" by raising her eyes.

That Mimi has a command of the sounds and structure of language are demonstrated by her performance on tests of language comprehension.

Mimi has not yet discovered language to be a means of influencing or controlling the events of her life. The findings of this study confirm the findings of Buzolich & Wiemann (1989) and Calculator (1988), Koppenhaver & Yoder (1991). The high levels of language proficiency demonstrated have not been transferred to the pragmatic functions of requesting or otherwise controlling the environment.

Mimi is beginning to realize that she express her own feelings and thoughts in words. She has begun to create stories, record personal experiences, write letters, and learn that her thoughts are valued and respected. She is also interacting more easily with her peers.

Summary and Conclusion

The speaking child experiences language as a tool to persuade, comfort, and control the interaction at hand (Ochs and Schieffelin, 1983). Personal narratives are laced with contextually linked propositions (Ochs and Schieffelin, 1983). Questions and directives serve as attention getting strategies as well as ways of acquiring information. Directives also serve to address immediate concerns. Children who rely on augmented systems need to experience augmented communication as a way of controlling and influencing their environment. Learning to ask questions, tell stories, and actively participate in conversation is based on experience with language interactions.

The pragmatic functions of language are gained in the course of language interactions in which children actively experience control of their environments. Turn-taking conversations, opportunities to engage in

dialogue and narrative need to be structured and made available to children who cannot speak. This study illustrated that high levels of language proficiency are not sufficient for the development of discourse and dialogue. Children who use augmented systems need to experience their language in social and environmental interactions in order to discover how to engage in discourse.

Awareness of language as a social tool goes beyond knowledge of language itself. Experience with social interaction is the necessary framework for learning how to interact with language whether it be in the form of communicating, conversing, telling stories, reading or writing. Speech act theory is a useful conceptual model for understanding the comunicatin problems of children who cannot speak.The author hopes to write a sequel to the present study as Mimi develops her awareness of language as a tool of social negotiation.

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